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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/728,671	12/05/2003	Thomas M. Morris		1286
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G. TURNER MOLLER, JR. 711 NORTH CARANCAHUA, SUITE 720 CORPUS CHRISTI, TX 78475			EXAMINER DONG, DALEI	
			ART UNIT 2879	PAPER NUMBER

DATE MAILED: 05/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/728,671

Applicant(s)

MORRIS, THOMAS M.

Examiner

Dalei Dong

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 December 2003.  
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-29 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 05 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/22/2004  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Oath/Declaration*

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.  
It does not identify the citizenship of each inventor.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 25-29 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,857,767 to Hochstein.

Regarding to claim 25, Hochstein discloses in Figures 1-4, a light emitting assembly (10), comprising: a metal substrate (12) having a surface providing an electrically insulating coating (16) less than one thousand microns thickness; a plurality of circuit traces (18) on the electrically insulating coating (16) providing terminals (18) and conductive paths (18) between the terminals for placing light emitting elements (20) in circuit, the circuit traces (18) comprising a quantity of silver effective to make the paths conductive, to make the terminals compatible with metal droplet (26) connections

Art Unit: 2879

and to reflect a significant amount of light away from the substrate; and at least one light emitting element (20) having leads (22) bonded to the terminals (18) with metal droplets (26).

Regarding to claim 26, Hochstein discloses in Figures 1-4, a light emitting assembly (10) comprising: a metal substrate (12) having a surface providing an electrically insulating coating (16) less than one thousand microns thickness; a plurality of circuit traces (18) on the coating providing terminals and conductive paths between the terminals for placing light emitting elements (20) in circuit; a plurality of light emitting element (20) having leads (22) bonded to the terminals (18); a shiny metallic area (circuit traces comprises of silver or gold which are shiny metallic) on the substrate for reflecting light from the light emitting elements away from the substrate (12) thereby increasing useful light from the assembly and reducing energy absorption by the substrate (12); and a clear finish covering at least part of the shiny metallic area (18) and reducing tarnishing thereof.

Regarding to claim 27, Hochstein discloses in Figures 1-4, the shiny metallic area (18) comprises a silver rich coating on the substrate.

Regarding to claim 28, Hochstein discloses in Figures 1-4, the shiny metallic area (18) comprises a silver rich coating for reflecting light from the light emitting elements (20) away from the substrate (12).

Regarding to claim 29, Hochstein discloses in Figures 1-4, the metal substrate (12) comprises a shiny light colored metal (aluminum) and the shiny metallic area (18) comprises part of the metal substrate (12).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3, 5, 7, 12-14, 16-19, 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,857,767 to Hochstein in view of U.S. Patent No. 6,670,751 to Song.

Regarding to claim 1, Hochstein discloses in Figures 1-4, a light emitting assembly (10), comprising: a metal substrate (12) providing an electrically insulating coating (16) less than one thousand microns thickness (see column 4, lines 21-32); a plurality of circuit traces (18) on the electrically insulating coating (16) providing terminals and conductive paths for placing light emitting elements (20) in the circuit, the terminal (18) being of a metal compatible with metal droplet connections (26); a plurality of light emitting elements (20) having leads (22) bonded to the terminals (18) with metal droplets (26).

However, Hochstein does not disclose a metal coating on the substrate in heat transmitting relation between at least some of the light emitting elements and the substrate transmitting heat from the light emitting elements to the metal substrate. Song teaches adding metal coating to the holes or void space (24) of Hochstein to make the light emitting elements release heat at a greater efficiency (see column 5, line 66 to column 6, line 4). Song also teaches in Figures 4 and 7, where metal paste or lump (18a-18e) fills the bottom hole of the light emitting device (23) for the purpose of achieve superior heat sink properties compared to the light emitting elements which have holes for heat sink only.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilize the metal coating or paste of Song for the void space below the light emitting elements of Hochstein in order to achieve superior heat sink properties compared to the light emitting elements which have holes for heat sink only.

Regarding to claim 2, Hochstein discloses in Figures 1-4, the metal substrate (12) is selected from the group consisting essentially of aluminum, aluminum alloys, magnesium, and magnesium alloys (see column 4, lines 15-20) and the electrically insulating coating is an anodized layer (see column 4, lines 56-58).

Regarding to claim 3, Hochstein discloses in Figure 1-4, the electrically insulating coating is a cured thick film coating (see column 4, lines 53-56).

Art Unit: 2879

Regarding to claim 5, Applicant claims the electrically insulating coating is a plasma applied coating, even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (see MPEP (2113).

Regarding to claim 7, Song teaches in Figures 4 and 7, the light emitting element (13) includes a metallic lower surface (secondary ceramic sheet made of alumina 12) and the metallic lower surface abuts the metal coating (18a-18e) and the reason to combine is the same as above.

Regarding to claim 12, Hochstein discloses in Figures 1-4, the circuit traces (18) are thin film traces.

Regarding to claim 13, Hochstein discloses in Figures 1-4, the circuit traces (18) are thick film traces.

Regarding to claim 14, Hochstein discloses in Figures 1-4, the substrate (12) comprises an area increasing undulating surface increasing the heat transmission capacity of the substrate.

Regarding to claim 16, Hochstein discloses in Figures 1-4, the metal droplet (26) is a wire-bonded connection.

Regarding to claim 17, Hochstein discloses in Figures 1-4, a resistor in thermal contact with the substrate (12) in circuit with the light emitting element (20) (see column 7, lines 21-24).

Regarding to claim 18, Hochstein discloses in Figures 1-4, a light emitting assembly (10), comprising: a metal substrate (12) providing an electrically insulating coating (16) less than one thousand microns thickness (see column 4, lines 21-32); a plurality of circuit traces (18) on the electrically insulating coating (16) providing terminals and conductive paths for placing light emitting elements (20) in the circuit, the terminal (18) being of a metal compatible with metal droplet connections (26); a plurality of light emitting elements (20) having leads (22) bonded to the terminals (18) with metal droplets (26).

However, Hochstein does not disclose a metal coating on the substrate in heat transmitting relation between at least some of the light emitting elements and the substrate transmitting heat from the light emitting elements to the metal substrate. Song teaches adding metal coating to the holes or void space (24) of Hochstein to make the light emitting elements release heat at a greater efficiency (see column 5, line 66 to column 6, line 4). Song also teaches in Figures 4 and 7, where metal paste or lump (18a-18e) fills the bottom hole of the light emitting device (23) and a clear finishing covering



Art Unit: 2879

at least part of the metal coating (18a-18e) and reducing tarnishing thereof for the purpose of achieve superior heat sink properties compared to the light emitting elements which have holes for heat sink only.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilize the metal coating or paste of Song for the void space below the light emitting elements of Hochstein in order to achieve superior heat sink properties compared to the light emitting elements which have holes for heat sink only.

Regarding to claim 19, Hochstein discloses in Figures 1-4, the circuit traces (18) provide the metal coating.

Regarding to claim 21, Hochstein discloses in Figures 1-4, a light emitting assembly (10), comprising: a metal substrate (12) providing an electrically insulating coating (16) less than one thousand microns thickness (see column 4, lines 21-32) covering part of the substrate; a plurality of circuit traces (18) on the electrically insulating coating (16) providing terminals and conductive paths for placing light emitting elements (20) in the circuit, the terminal (18) being of a metal compatible with metal droplet connections (26); a plurality of light emitting elements (20) having leads (22) bonded to the terminals (18) with metal droplets (26).

However, Hochstein does not disclose electrically insulating coating providing at least one hole with light emitting elements being positioned over the hole. Song teaches in Figure 3C, a hole (41a and 42a) is formed in the secondary ceramic sheet or insulating

Art Unit: 2879

coating (44) with light emitting element (43) being positioned over the hole for the purpose of superior heat sink property.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have formed a hole of Song in the insulating coating of Hochstein in order to achieve superior heat sink property.

Regarding to claim 22, Hochstein discloses in Figures 1-4, the metal substrate (12 made of aluminum) exposed by the hole in the coating reflect light away from the metal substrate (12) thereby increasing the reflectivity of the substrate and increasing the amount of light emitting from the assembly.

Regarding to claim 23, Song teaches in Figures 4 and 7, the light emitting element (13) includes a heat dissipating member (18a-18e) juxtaposed to the hole in the coating thereby transferring heat from the light emitting element to the metal substrate and the reason to combine is the same as above.

Regarding to claim 24, Song teaches in Figures 4 and 7, the heat dissipating member (18a-18e) is a metal member and the metal member abuts the substrate through the hole in the coating and the reason to combine is the same as above.

Art Unit: 2879

6. Claims 4 <sup>is</sup> ~~are~~ rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,857,767 to Hochstein in view of U.S. Patent No. 6,670,751 to Song and in further view of U.S. Patent No. 3,598,985 to Harnden Jr.

Regarding to claim 4, Hochstein discloses in Figures 1-4, a light emitting assembly (10), comprising: a metal substrate (12) providing an electrically insulating coating (16) less than one thousand microns thickness (see column 4, lines 21-32); a plurality of circuit traces (18) on the electrically insulating coating (16) providing terminals and conductive paths for placing light emitting elements (20) in the circuit, the terminal (18) being of a metal compatible with metal droplet connections (26); a plurality of light emitting elements (20) having leads (22) bonded to the terminals (18) with metal droplets (26).

However, Hochstein does not disclose a metal coating on the substrate in heat transmitting relation between at least some of the light emitting elements and the substrate transmitting heat from the light emitting elements to the metal substrate and electrically insulating coating is a porcelain enamel. Song teaches adding metal coating to the holes or void space (24) of Hochstein to make the light emitting elements release heat at a greater efficiency (see column 5, line 66 to column 6, line 4). Song also teaches in Figures 4 and 7, where metal paste or lump (18a-18e) fills the bottom hole of the light emitting device (23) for the purpose of achieve superior heat sink properties compared to the light emitting elements which have holes for heat sink only.

Harnden Jr. teaches a metal substrate (23) is coated with the insulating material (24) comprises of porcelain enamel or glass, or some other suitable vitreous material (see

column 3, lines 25-29) for the purpose of provide an efficient insulate and isolate path between different electrical components.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilize the electrically insulating coating of Harnden Jr. and the metal coating or paste of Song for the void space below the light emitting elements of Hochstein in order to achieve superior heat sink properties compared to the light emitting elements which have holes for heat sink only and provide an efficient insulate and isolate path between different electrical components.

7. Claims 6, 8-11, 15 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,857,767 to Hochstein in view of U.S. Patent No. 6,670,751 to Song and in further view of U.S. Patent No. 5,098,864 to Mahulikar.

Regarding to claim 6, Hochstein discloses in Figures 1-4, a light emitting assembly (10), comprising: a metal substrate (12) providing an electrically insulating coating (16) less than one thousand microns thickness (see column 4, lines 21-32); a plurality of circuit traces (18) on the electrically insulating coating (16) providing terminals and conductive paths for placing light emitting elements (20) in the circuit, the terminal (18) being of a metal compatible with metal droplet connections (26); a plurality of light emitting elements (20) having leads (22) bonded to the terminals (18) with metal droplets (26).

However, Hochstein does not disclose a metal coating on the substrate in heat transmitting relation between at least some of the light emitting elements and the

Art Unit: 2879

substrate transmitting heat from the light emitting elements to the metal substrate and the metal coating provides a shiny metal patch reflecting light from the light emitting element away from the substrate thereby increasing the reflectivity of the assembly and increasing the amount of light emitting from the assembly. Song teaches adding metal coating to the holes or void space (24) of Hochstein to make the light emitting elements release heat at a greater efficiency (see column 5, line 66 to column 6, line 4). Song also teaches in Figures 4 and 7, where metal paste or lump (18a-18e) fills the bottom hole of the light emitting device (23) for the purpose of achieve superior heat sink properties compared to the light emitting elements which have holes for heat sink only.

Mahulikar teaches in Figure 2, a metal coating (46) provides a shiny metal (silver) patch reflecting light from the light emitting element (32) away from the substrate (12) for the purpose of increasing the reflectivity of the assembly and increasing the amount of light emitting from the assembly.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilize shiny metal patch of Mahulikar for the electrically insulating coating of Harnden Jr. for the void space below the light emitting elements of Hochstein in order to achieve superior heat sink properties compared to the light emitting elements which have holes for heat sink only and increasing the reflectivity of the assembly and increasing the amount of light emitting from the assembly.

Regarding to claim 8, Hochstein discloses in Figures 1-4, circuit traces (18) is made of silver or gold or an alloy thereof (see column 5, lines 1-6) and Mahulikar teaches

Art Unit: 2879

in Figure 2, metal coating (46) comprises of silver and thus the circuit traces and the metal coating are the same material (silver) and the reason to combine is the same as above.

Regarding to claim 9, Hochstein discloses in Figures 1-4, circuit traces (18) is made of silver or gold or an alloy thereof (see column 5, lines 1-6) and Mahulikar teaches in Figure 2, metal coating (46) comprises of silver and thus the circuit traces and the metal coating are the same material (silver) and the reason to combine is the same as above.

Regarding to claim 10, Mahulikar teaches in Figure 2, a clear finish over the metal coating thereby reducing tarnishing of the silver and the reason to combine is the same as above.

Regarding to claim 11, Hochstein discloses in Figures 1-4, circuit traces (18) is made of a mixture of epoxy (glass) and silver or gold or an alloy thereof (see column 5, lines 1-6) and Mahulikar teaches in Figure 2, metal coating (46) comprises of silver and epoxy (glass), and the reason to combine is the same as above.

Regarding to claim 15, Mahulikar teaches that it is old and well known in the art to utilize a solder connection for connecting electrical components. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to

Art Unit: 2879

have utilize the solder connection of Mahulikar for the light assembly in order to securely and reliably connect the electrical components.

Regarding to claim 20, Hochstein discloses in Figures 1-4, circuit traces (18) is made of silver or gold or an alloy thereof (see column 5, lines 1-6) and Mahulikar teaches in Figure 2, metal coating (46) comprises of silver and thus the circuit traces and the metal coating are the same silver based material and the reason to combine is the same as above.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following prior art are cited to further show the state of the art of composition of a light emitting assembly.

U.S. Patent No. 5,785,418 to Hochstein.

U.S. Patent No. 6,045,240 to Hochstein.

U.S. Patent No. 6,428,189 to Hochstein.

U.S. Patent No. 6,517,218 to Hochstein.

U.S. Patent No. 6,582,100 to Hochstein.

U.S. Patent No. 6,614,103 to Durocher.

Art Unit: 2879

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalei Dong whose telephone number is (571)272-2370. The examiner can normally be reached on 8 A.M. to 5 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar Patel can be reached on (571)272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



D.D.

January 11, 2005



Joseph Williams  
Primary Examiner  
Art Unit 2879